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TAICHI EFFICACY FOR β-ENDORPHIN IN THE AGING PROCESS: A LITERATURE REVIEW

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ABSTRACT

The aging process can be delayed by exercises such as taichi and meditation. They are useful for reducing oxidative stress, inflammation, and cellular aging. The older people will be more fit and happy. One of the parameters is β-endorphin. This literature review will investigate the effect of taichi determined by beta-endorphin in the aging process. Google Scholar, Researchgate, and Mendeley were used as the search engine. The keywords were taichi, endorphin, & anti-aging. The effect of taichi on beta-endorphin in the aging process was analyzed from 7 articles. The aging process changes body homeostasis, organ systems, and other so it will reduce the functional capacity from the cellular to the individual level. In case of the cellular level, beta-endorphin is one of the parameter for tai chi efficacy. Beta-endorphin can give happiness so that the elderly can get a better homeostasis. The endorphin change after taichi so the aging process will improve.

Keywords: taichi; anti-aging; beta-endorphin

INTRODUCTION

Indonesia is going to give the demographic bonus so there will be 100 million citizens older than 60 years old by 2050. The number of older people in Indonesia was 10% in 2016.[1] Longer life expectancy can be beneficial for our country.[2] However, old people often have a poor quality of life. They can be sick easily compared with the younger generation. Older people also own other social issues.[3] Depression and anxiety are more potentials in an older population.[4] β-endorphin levels can predict an individual's social network structure.[5] β-endorphin is a peptide molecule that can affect the human body. β-endorphin is the primary agonist of opioid receptors for regulating the brain and immune cells as the body has potent analgesic effects.[6]

Tai Chi programs can reduce β-endorphin levels in older populations who have chronic pain.[7] Taichi's psychological and physical benefits should be researched more thoroughly. [8] As a result, policies and methods for encouraging sports and physical activity are needed to lessen the ageing, bad health, and functioning implications, while also taking into account and addressing the structural co-determinants involved.[9] Based on this context, this article will delve deeper into the efficacy of taichi for β-endorphins in the aging process.

METHOD

Google Scholar, Researchgate, Pubmedia, and Mendeley were used as search engines. The method uses journals and preliminary research publications. The effects of tai chi on β-endorphin levels in the elderly are explored. The keywords were tai chi, endorphin, and antiaging. The literature search yielded 163,000 articles. There were 5 trusted articles with inclusion criteria of literature publication years. Indonesian or English was used. Non-full-text literature is excluded.

RESULTS

Seven articles have shown the change in β-endorphin in the elderly. Tai chi was programmed for 12 to 24 weeks. The number of participants varied and the age group was approximately 65 years.

Table 1. The Analysis of The Tai chi Effect to Change Beta-endorphin Levels in Elderly

No	Article	Goal	Physiological	Age	Population	Study Length	Intervention	Results
1	You T, et al 2020.[7]	To assess inflammatory markers in older adults with chronic pain	The endocrine, immune system	74 years (range 65–87 years)	N = 40 F = 17 M = 23	12 weeks	Compared with the light physical exercise group with 1-hour duration for each class twice per week	Depletion of plasma β-endorphin levels
2	Jing Zhao, 2020.[10]	To know the changes in bone mineral density in perimenopausal women	Endocrine, musculoskeletal	45-55 years	74 perimenopausal women	48 weeks (twice a week, 60 minutes/times)	48 weeks (twice a week, 60 minutes/times).	Significant increase in plasma beta-endorphin levels
3	You, Tongjian Ogawa, et al, 2017.[11]	To investigate Mobility in Older Adults with Multisite Pain	Endocrine, musculoskeletal	Older adults aged ≥65 years	a Tai Chi (N=28) light physical exercise (N=26)	offered twice weekly for 12 weeks.	Comparison with light physical exercise program	Increasing the level of β-endorphin
4	Giannitrapani, Karleen et.al, 2019.[12]	To compare with other complementary and Integrative Health Therapies for Pain	Endocrine, neurology	11 electronic databases.	Systematic reviews met our inclusion criteria: tai chi (21).	an "evidence map," or a visual display, of the literature size and broad estimates of effectiveness	the strength of the evidence	Tai chi, mindfulness, and massage can be effective for multiple kinds of chronic pain.
5	Zhou, Min et.al, 2018.[13]	To know the brain Metabolism and Muscle Energetics improvement	Endocrine, neurology	Six healthy older adults	A brain 1H MRS and a muscle 31P MRS were scanned before and after the training,	enrolled in a 12-week Tai Chi program.	to measure N-acetyl aspartate to creatine (NAA/Cr) ratios and phosphocreatine (PCr) recovery time	significant increase of NAA/Cr ratios in the posterior cingulate gyrus PCr recovery time improvement in

	leg muscles

DISCUSSION

Tai chi altered the elderly endorphin levels who have chronic pain. [7] Stress triggers the pituitary gland to release endorphin, a neuropeptide hormone with immune-boosting effects. The non-opiate receptor increases β-endorphin mitogenesis, affecting the elderly's immune system. POMC production is studied for its effects.[14]

Endorphins are opioid neuropeptides that are naturally produced in the body and act mainly as an inhibitor of pain perception and are present in pleasant situations.[15] As agonists of the body's opioid receptors, β-endorphins are known for their strength and pain-relieving effect. They are also related to homeostasis-restoring behavior.[6]

Tai chi can improve the physical and mental health of the elderly. After short-term tai chi training, the N-acetyl aspartate to creatine ratio (NAA/Cr) increased significantly in the posterior cingulate gyrus and restored leg muscle creatine phosphate (PCr).[13] Older people will greatly improve the beneficial tai chi mechanism. Tai Chi interventions produce beneficial neurological changes in the human brain. [16]

The opioids were used for the alternative therapy of pain management. This complementary and integrative health therapy may help some types of chronic pain patients. Other randomized clinical trials (RCTs) with sufficient power to demonstrate tai chi and other types of pain intervention are warranted.[17,12]

Another parameter for tai chi research in the elderly is the telomere molecule. Telomeres are DNA protein structures. They are at the ends of chromosomes. Telomeres are involved in the physical aging process. The effects of tai chi on telomerase activity (TA) and gel transmittance (GT) in peripheral blood mononuclear cells and the association of TA and GT with tai chi are controversial. Tai Chi can protect TA and improve GT. TA increased with increasing GT.[18]

The function of cerebral vessels in the elderly is also significantly weakened compared to that of young people and strongly correlates with age. Compared to an older control group, Tai Chi practitioners showed significant improvements in cerebrovascular hemodynamic index (CVHI) scores (cerebrovascular hemodynamic index), mean blood flow velocity, peak blood flow velocity, and blood flow velocity.[19]

There have been few studies on the effects of Tai Chi on perimenopause and bone mineral density. Tai chi practice for 48 weeks can significantly improve symptoms in perimenopausal women, implying that changes in plasma dopamine and beta-endorphin levels are one of the contributing factors to symptom relief in perimenopause.[10] Another study found that practicing tai chi has a significant effect on lowering blood sugar in type 2 diabetes patients. Practicing tai chi can also change blood sugar levels. [20] Tai chi is frequently practiced. Superoxide dismutase and catalase levels increased repeatedly, while lipoperoxide levels decreased.[21]

Tai chi had a significant positive effect on self-efficacy in 5 studies. Only one study found negative results at follow-up. Furthermore, it is unknown which types, frequencies, and durations of tai chi interventions are most effective in increasing self-efficacy. Tai chi appears to be linked to increased self-efficacy.[22] When practitioners are motivated enough, Tai chi can improve mental alertness and leadership. Tai Chi improved the frame of mind attention. Contrary to popular belief, the primary negative results in non-Chinese participants can attribute to lower motivation and a relatively short duration of tai chi practice.[23]

CONCLUSION

Tai chi can influence the aging process in several organ systems, especially in neuroendocrine system, as monitored by beta endorphin levels as shown in 5 articles used. Clinical-level molecular, cellular, and organic evidence for the effectiveness of tai chi were showed for regulating β-endorphin levels in the elderly. Tai chi can be an alternative to an anti-aging lifestyle. It is hoped that future anti-aging tai chi research will be conducted with a larger sample size, gender balance, and specific age restriction criteria.

CONFLICT OF INTEREST

Nothing is considered a conflict of interest.

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